
LABORATORY

OF THE

DEPARTMENT OF TRADE AND COMMERCE

OTTAWA, CANADA

BULLETIN No. 415

MAPLE SUGAR

NOTES AND COMMENTS.

Under this heading, as occasion arises, the Bulletins issued by this Department will contain, as an appendix, such comment as may seem necessary or advisable upon matters relating to the work of the Department in connection with the administration of the Adulteration Act, the Fertilizers Act, the Feeding Stuffs Act or the Proprietary Medicines Act.

It frequently happens that correspondents ask information regarding the above Acts, of such nature that the matter in question possesses general interest, and comment upon it would prove acceptable and useful to others than the immediate questioner. In such cases the reply may find a place in these columns. For convenience of reference these notes will be numbered in series.

A. MCGILL,
Chief Analyst.

USE OF SACCHARIN.

Note. 10.

OTTAWA, September 19, 1918.

Consequent upon order No. 60 of the Canada Food Board, published on the 5th inst. in the *Canada Gazette*, the use of sugar is greatly restricted and the manufacture of products characterized by their sweetness are to this extent handicapped.

Many requests to use saccharin have been received and the following concessions are made for the period under which order No. 60 will be enforced:

Saccharin may be used as a sweetener to make up the deficiency of sugar (regarded as a sweetener only), provided that declaration of the presence of saccharin is made.

The value of pure saccharin (saccharin puriss) in relation to sugar may be taken as 500 to 1; in other words, 1 pound saccharin is equal in sweetness to 500 pounds of sugar. Commercial saccharin is usually standardized to a strength of 300; that is, 1 pound of commercial saccharin is equal in sweetness to 300 pounds of sugar. Since some manufacturers standardize saccharin to other strengths, it is necessary for the user to acquaint himself with the exact nature of the article employed by him.

Saccharin must not be employed without declaration of its presence; this is necessary for two reasons: in the first place saccharin possesses no food value and the nutritive value of an article in which saccharin replaces sugar is lessened to the extent to which sugar is absent; in the second place while saccharin is regarded as practically harmless in the case of healthy persons and in quantities not exceeding 0.3 gram per day (4.65 grains) it is certain that many individuals cannot use saccharin without injury; for this reason the presence of saccharin must be noted so that physicians may be properly advised.

A. MCGILL.

Chief Analyst.

CURRENTS.

Note 11.

OTTAWA, September 19, 1918.

The *currant* of commerce gets its name by a corruption of the word *Corinth*. The port of Corinth, Greece, was originally the point from which these goods were shipped. They are produced in the Ionian Islands.

This currant is really a small variety of the grape; and is not a currant at all in the sense in which we apply this term to the red, black and white currants of our gardens.

If this same variety of grape were grown elsewhere than in the Ionian Islands, would it be proper to name it a currant? Under ordinary conditions of trade, I believe that no objection would be taken to such action, provided that the name of the locality where it was grown preceded the word. Thus, this grape when grown in California might be called *Californian Currant*, thus distinguishing between the small variety of grape, and the normal Californian grape, which is of much larger size. Long and world wide usage has sanctioned the term *Currant*, as applied to the same fruit from Greece. Speaking academically it should never have been called *Currant*, but it is too late now to quarrel with the name.

Actual currants from Greece are, owing to restrictions upon shipping, scarcely to be found on our markets; and the small quantities available command an abnormally high price, not because of their intrinsic excellence, but because of temporary scarcity. The California product has actual value; but if offered under a name which properly identifies it as a California Seedless Raisin, it comes into competition with other seedless raisins, and must be sold at their price, which I understand is about 16 cents per pound. By offering it, however, as a *Currant*, and thus implying that it has a

foreign (transatlantic) origin, it becomes possible to secure the price of European Currants for it; which price is, under war conditions, approximately double that of seedless raisins.

While, therefore, it may be argued that this article is specifically the same as the European Currants, the labelling it as a *Currant*, especially when the fact that it comes from California is not made known, enables a fraud to be perpetrated and this constitutes adulteration under Section 3, (d) of the Act.

If it be true that the small California raisins above referred to, are not the average fruitage of *Vitis*, but are the culls from sifting out the larger and more valuable seedless raisins, the character of the fraud, as such, is intensified.

Seedless raisins from California must be labelled such; or if the small variety be offered as *Currants*, they must be labelled as *California Currants*.

A. MCGILL.

Chief Analyst.

USE OF THE WORD "MAPLE" IN LABELLING.

Note 12.

OTTAWA, September 20, 1918.

An Amendment to the Adulteration Act of April 15, 1915, enacts as follows (Sec. 29A, 3):

"The word 'maple' shall not be used, either alone or in combination with any other word or words, or letter or letters, on the label or other mark, illustration or device on a package containing any article of food, or on any article of food itself, which is not pure maple sugar or pure maple syrup, and any article of food labelled or marked in violation of this subsection shall be deemed to be adulterated within the meaning of this Act."

The staple forms in which the maple orchard products come upon the market, are syrup and sugar; and the evident intention of the above amendment is to prevent other syrups or sugars being fraudulently substituted for maple products.

To some extent, maple products appear in less concentrated form than sugar, and these articles are frequently described as maple cream, maple butter or maple cheese; where the modifying words, cream, butter and cheese refer to consistency only, and are not intended to declare the actual presence of cream, butter or cheese. Such articles will be regarded as adulterated if they are not wholly the product of maple sap.

If articles described as maple cream, maple butter or maple cheese are held to be compounds, containing actual cream, butter or cheese, this claim must appear upon the label, and the amount of cream, butter or cheese respectively must also be plainly declared upon the label; the maple syrup or sugar entering into the composition of the article must be genuine maple syrup or sugar respectively; and no other syrup or sugar than genuine maple syrup or sugar may be present. Otherwise they will be held to violate the above quoted section of the Act.

When pure maple syrup or sugar is employed to give flavour to confectionery (candy, cakes, etc.) it becomes necessary to use the word *maple*, just as when lemon, peppermint, vanilla, or other flavour is present it becomes necessary to use these words as adjectives. This use of the word *maple* is held not to contravene the regulation above quoted. Candies, cakes, etc., are necessarily composite articles, and everybody understands quite well, that they are not intended to displace maple products, because they are flavoured with maple, but rather that they are forms in which a market for maple products is created. It is however to be noted that only *genuine maple syrup* or *sugar* may be employed as flavouring material in cases where maple flavour is claimed for confectionery.

A. MCGILL.

Chief Analyst.

SEPARATED MILK.

Note 13.

OTTAWA, September 22, 1915.

Correspondence on file in this office shows that many persons are unacquainted with the exact meaning of the term *separated milk*.

When milk is allowed to stand at rest for a longer or shorter period (12 to 24 hours) at ordinary temperature, a more or less complete separation of the milk fat from the non-fat components takes place. The fat being lighter than the remainder of the milk, rises to the surface, and may be removed with a spoon or perforated ladle. This portion, so removed, is known as *cream*, and consists essentially of the milk fat, with more or less of the other constituents of the milk, the amount of these depending upon the care exercised in skimming, and the length of time allowed for the cream to rise to the surface.

The remaining portion of the milk, after removal of the cream, is known as *skimmed milk*, or *skim milk*. It contains the casein, milk sugar (lactose) and other components of whole milk, except so far as these have been removed with the cream. It is a valuable food material. The process of removing cream above described, is that which obtains in most of the smaller dairies; and it obtained universally, until a machine known as a *separator* was invented.

This machine is now very widely used and it effects the separation of the cream from the milk by centrifugal force. The process is essentially a skimming of the milk by machinery instead of by hand. The residual milk after separation of the cream is *skimmed milk*; but to distinguish it from milk skimmed in the ordinary way, it may be described as *machine skimmed*, or *separated milk*.

There are certain characteristic differences between the two forms of skim milk which may be pointed out as follows:

Hand skimmed milk has necessarily stood for several hours after being drawn from the cow. It is usually kept at a low temperature during this period (about 50° Fah.) because the cream rises better at this temperature, and less souring of the milk occurs. Nevertheless increase of acidity, due to conversion of milk sugar into lactic acid, always takes place; and may develop to such an extent that the skim milk tastes sour. If this increase in sourness goes beyond a certain limit, the casein of the milk will coagulate and the skim milk will thicken, (*lapped milk*). In order to retain desirable sweetness in the skim milk, the cream is usually removed before all the fat of the milk has risen. Hence, hand skimmed milk generally retains a portion of the milk fat.

Machine skimmed milk, or so-called *separated milk*, is prepared by the use of a *separator*; and it is not necessary to allow any appreciable time to elapse between milking and removing the cream by the machine. Hence, the acidity natural to the milk, is not notably increased, and the skim milk is, to all intent, as sweet as fresh milk.

Although by varying the rate of speed at which the Separator is worked, it is possible to leave more or less of the fat in the separated milk, this is not usually done, and would be considered bad business. As a rule the fat is more completely removed by the machine, than is practicable by hand skimming; and the separated milk is, to this extent, inferior in food value, to hand skimmed milk. It has, however, the possible advantage of cleanliness and sweetness; and as the use of the Separator, especially the larger sizes, is commonly practised by well organized and equipped factories, it is fair to assume that great care is exercised in maintaining a high standard of purity, both as regards the machine itself, and the raw milk.

A. MCGILL,

Chief Analyst.

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DEPARTMENT OF TRADE AND COMMERCE
OTTAWA, CANADA

BULLETIN No. 415

MAPLE SUGAR

OTTAWA, October 29, 1918.

F. C. T. O'HARA, Esq.,
Deputy Minister of Trade and Commerce,
Ottawa, Ont.

Sir,—I beg to hand you with this a report on 137 samples purchased as Maple Sugar by our inspectors in April and May of this year.

The production of Maple Sugar constitutes an industry of considerable importance to Canada, and in some localities becomes a highly important source of revenue, since it is naturally a farm product, and made at a time of the year when farmers are not otherwise busy. The maple bush is at the same time a source of domestic fuel and of marketable sugar and syrup, and frequently occupies rocky ground that could not be otherwise developed to profit. The fact that its revenue production comes in early spring, at a time of the year when money is needed, and when little farm produce of other sorts is available, helps to make this source of income important to the small farmer. It will readily be understood that any unwarrantable interference with the industry, making it unprofitable, constitutes a temptation to the farmer to cut down his trees and sell them as fire wood at present high prices of fuel. Such destruction of our maple orchards, would be a national calamity. The hard maple is a slow growing tree, and orchards could not readily be replaced; indeed it is unlikely that they would ever be replaced.

Recognizing the importance of this industry, the Department of the Government charged with the administration of the Adulteration Act, has sought to safeguard the producers of maple products through the Act named. Extensive investigation of the subject was undertaken in 1911, and results are published in Bulletin No. 226 of this series. Carefully written standards for Maple Sugar and Maple Syrup were published by Order in Council of 27th October, 1911 (G. 994), and have since been appended as a Sixth Schedule to the Adulteration Act. (Revision of 12th June, 1914).

The necessity for special standardization of maple sugar becomes apparent when we remember that the sugar contained in solution in maple sap is specifically identical with that of the cane and the beet; the peculiarities which give maple sugar its distinctive value are therefore due to material which is not sugar, and which may easily, by appropriate treatment, be removed from the article (which then becomes simply a pure sucrose) or which may, with equal ease, be added to cane or beet sugar,

thereby changing these last into material closely resembling maple sugar, and capable of coming into competition with maple sugar on the market. The characteristic non-sugar materials referred to are essentially malic acid in combination with lime, and volatile oils. It is to these substances that maple sugar owes its peculiar flavour and its commercial value. In other words, the specific value of maple sugar is due to the fact that it is made directly and by very simple methods, from maple sap. The processes of manufacture do not remove, and are not intended to remove, from the finished article, those non-sugar substances which were associated with it in the sap.

In this respect the manufacture of maple sugar differs markedly from that of cane and beet sugars. These last are associated, in the juice of the cane and the beet, with substances which, unless carefully removed by refining processes, would give the sugar a very unpleasant flavour, well known to any one who has seen so-called *raw-sugar*. Maple sugar is actually a raw sugar; but it differs from the raw sugar of commerce in that its congeners are of pleasant flavour, and their retention in the finished product is to be desired. The amount of these congeners is variable; and the importance of the study published in Bulletin No. 228 lies to the necessity of fixing legal minima below which limits, a sample could with certainty, be declared adulterated. The report referred to contains the results of work done upon 456 samples of maple syrup obtained directly from producers, accompanied with declaration of genuineness. In consequence of our findings, the following standards have been fixed as above explained:

MAPLE SUGAR.

"Maple sugar is the solid product resulting from the evaporation of maple sap, or of maple syrup, and contains not more than ten (10) per cent of water. It yields not less than six-tenths (0.6) of one per cent of ash, reckoned on the dry matter of the sugar when incinerated in such a way as to assure the earths being present as salts and not as oxides, and not less than twelve one-hundredths (0.12) of one per cent of ash, insoluble in water, employed as described below. It yields not less than three-tenths (0.3) per cent of malic acid, reckoned on the dry matter, when worked as described below. It yields a *lead number* not less than one and seven-tenths (1.7) when worked by the Canadian method, nor less than one and two-tenths (1.2) when worked by the Winton method, as described below."

It may be explained that while the work reported in Bulletin 228, was performed upon samples of maple syrup, it had reference to the sugar content of these samples. Maple syrup is merely a less concentrated form of maple sugar.

Both before 1911, the date of the above mentioned study, and since that time, many hundreds of samples of maple sugar (and syrup) have been examined in these laboratories, and the large experience gained justifies me in saying that our standards for the article are such as to allow a safe margin; in other words, it is impossible that their application would condemn as fraudulent, any sample of maple sugar made directly from maple sap.

The converse of this is, however, not true. Many samples of maple sap are of such a character that their content of the congeners to which maple sugar owes its distinctive value, is far above the minimum limit fixed by law. To sugar made from sap of the kind indicated, it may be possible to add cane sugar, having another source than the maple tree, without thereby reducing the amount of the contained congeners in the finished product below legal limits. Based upon this fact there is found on our markets a large amount of so-called maple sugar, which is not maple sugar in a legal sense; but a mixture of maple sugar with cane sugar from other sources. And the difference in price between maple sugar and other sugar is such as apparently to make the described sophistication a profitable business. The Adulteration Act was revised in June, 1914, by addition of section 29A, as follows:—

"29A. No person shall manufacture for sale, keep for sale, or offer or expose for sale, as maple sugar any sugar which is not pure maple sugar, nor as maple syrup any syrup which is not pure maple syrup, and any maple sugar or maple syrup which is not up to the standard prescribed by the Sixth Schedule to this Act or, if such standard is changed by the Governor in Council, to such standard as the Governor in Council may from time to time prescribe, shall be deemed to be adulterated within the meaning of this Act.

"2. The word 'maple' shall not be used either alone or in combination with any other word or words on the label or other mark, illustration or device on a package containing any article of food or on any article of food itself which is or which resembles maple sugar or maple syrup, and no package containing any article of food or any article of food itself, which is not pure maple sugar or pure maple syrup, shall be labelled or marked in such a manner as is likely to make persons believe it is maple sugar or maple syrup which is not pure maple sugar or pure maple syrup, and any article of food labelled or marked in violation of this subsection shall be deemed to be adulterated within the meaning of this Act."

This section was again revised in April, 1915, and now reads as follows:—

"29A. No person shall manufacture for sale, keep for sale, offer or expose for sale, or sell, any article of food resembling or being an imitation of maple sugar or maple syrup, or which is composed partly of maple sugar or maple syrup, and which is not pure maple sugar or pure maple syrup.

"2. Any maple sugar or maple syrup which is not up to the standard prescribed by the sixth schedule to this Act, or, if such standard is changed by the Governor in Council, to such standard as the Governor in Council may from time to time prescribe, shall be deemed to be adulterated within the meaning of this Act.

"3. The word 'maple' shall not be used, either alone or in combination with any other word or words, or letter or letters, on the label or other mark, illustration or device on a package containing any article of food, or on any article of food itself, which is not pure maple sugar or pure maple syrup, and any article of food labelled or marked in violation of this subsection shall be deemed to be adulterated within the meaning of this Act."

It will be noted that this amendment has especial reference to the kind of manipulation just mentioned.

The results of the present investigation may be thus summarized:—

Genuine maple sugar.....	69 samples.
Adulterated maple sugar	62 "
Meet legal requirements.....	6 "
Total	137 "

The following table gives details in the case of adulterated samples.

BULLETIN No. 415—MAPLE SUGAR—TABLE I.

Date of Purchase.	No. of Sample.	Name and Address of Vendor.	Name and Address of Manufacturer or Furnisher, as given by the Vendor.		Nature of Adulteration.
			Manufacturer.	Furnisher.	
1916.					
April 19	83401	R. E. Harris & Son, Wolfville, N.S.	Maples Ltd., Toronto, Ont.	Yeaton & Sons, Hantsport, N.S.	Glucose and foreign sugar.
" 24	83403	Bauld Bros., Ltd., Halifax, N.S.	"	Mfrs.	"
" 2	84417	Canada Maple Exchange Ltd., Montreal.	Vendors	"	"
Mar. 15	80564	D. A. Roe & Co., Carleton Place, Ont.	Maples Ltd., Toronto, Ont.	"	"
" 25	80567	Wm. McGahey, Pembroke, Ont.	"	"	"
" 25	80568	J. Wolfe, Pembroke, Ont.	Montreal Biscuit Co., Montreal.	"	Foreign sugar.
" 25	80570	M. S. Klar, Pembroke, Ont.	"	N. Kouri, Ottawa, Ont.	"
April 5	80585	C. H. Hitchcock, Smith's Falls, Ont.	"	"	Glucose and foreign sugar.
" 16	80602	W. A. Hunter & Sons, Pembroke, Ont.	Maples Ltd., Toronto, Ont.	"	"
May 3	80631	McGregors Ltd., Ottawa, Ont.	"	"	"
" 4	80638	N. Dean & Son, Renfrew, Ont.	"	H. N. Bate & Sons, Ltd., Ottawa, Ont.	"
" 7	80649	Wm. Hamilton & Son, Chesterville, Ont.	"	G. Robertson & Son, Kingston, Ont.	"
April 9	79075	Geo. Boyle, Belleville, Ont.	"	Eby Blain, Ltd., Toronto, Ont.	"
" 10	79078	W. Burnet, Cobourg, Ont.	"	Armstrong & Paffard, Toronto, Ont.	"
" 10	79079	Hoeey & Son, Cobourg, Ont.	"	Perkins Ince & Co., Toronto, Ont.	"
" 10	79080	F. H. Brown, Port Hope, Ont.	Maples Ltd., Toronto, Ont.	Armstrong & Paffard, Toronto, Ont.	"
" 10	79081	Chas. Hutchings, Port Hope, Ont.	"	Mfrs.	"
" 11	79082	G. A. Pringle, Peterboro, Ont.	Canada Maple Exchange, Montreal.	Chas. Rishor	"
May 7	84186	A. T. G. Robinson, Toronto, Ont.	Maples Ltd., Toronto, Ont.	"	"
" 7	84187	J. I. Jackson, Toronto, Ont.	"	Eby Blain Ltd., Toronto, Ont.	"
" 8	84188	W. J. Dillon, Toronto, Ont.	"	Joseph Prager, Toronto, Ont.	"
" 11	84192	W. J. Nichol, Toronto, Ont.	Small's Ltd., Montreal.	"	"
" 11	84193	A. E. Bullock, Toronto, Ont.	Maples Ltd., Toronto, Ont.	"	Foreign sugar.
" 11	84194	D. Milne, Toronto, Ont.	"	Canada Brokerage Ltd., Toronto, Ont.	Glucose and foreign sugar.
April 24	84111	C. A. Robins, Dunnville, Ont.	"	"	Glucose and foreign sugar.
" 24	84112	Dunnville Arcade, Dunnville, Ont.	"	"	"
" 25	84113	C. W. Vahey, Bridgeburg, Ont.	Maples Ltd., Toronto, Ont.	"	"
" 26	84114	A. Many, Welland, Ont.	"	M. Woolnough & Co., Niagara Falls, Ont.	"
" 30	84115	W. H. Martin, Niagara Falls South, Ont.	"	"	"
May 1	84116	Garner Bros., St. Catharines, Ont.	Maples Ltd., Toronto, Ont.	W. H. Merriman & Co., St. Catharines, Ont.	"
" 1	84117	J. Foley, St. Catharines, Ont.	"	M. Woolnough & Co., Niagara Falls, Ont.	"
" 1	84118	J. S. Savage, Thorold, Ont.	"	Chase Bros., St. Catharines, Ont.	"

Five (5) samples contain cane sugar only as foreign material. Fifty-seven (57) samples contain glucose, as well as cane sugar.

Six (6) samples I have not described as genuine, although they meet legal requirements, and must be regarded as legally genuine. It does not follow that they are actually so. As a matter of fact, the analytical numbers are decidedly suspicious; and a comparison with the figures found for undoubtedly genuine samples will make this evident.

All of the samples found adulterated were sold to our inspectors as Maple Sugar (one sample as maple sugar bon-bons). It is quite evident that the retail vendor understood them to be maple sugar, or meant that the purchaser should so understand them. The manufacturers assert, at least in some instances, that these articles were not furnished by them as maple sugar, but under some other name. However, this may be. I find that many invoices from wholesalers describe the material as maple sugar, thereby apparently justifying its sale at retail as such. Even if sold by another name the article is illegal, as violating the requirements of Section 29A, revision of 1915.

Maple Sugar as Flavouring.

I do not understand Section 29A of the Adulteration Act as intended to interfere with the employment of maple sugar as a flavouring material. When, however, maple sugar is so used, the Act is sufficiently clear in requiring that the article, as offered for sale, must be of such character, and so described, as to make it impossible that it should be taken for maple sugar or maple syrup.

Cakes for example, may be coated with an icing having maple flavour, and layered cakes may have maple flavoured sweetening between the layers. Candies of many kinds, may contain the flavour of maple, although the candy mass may consist of chocolate, gum or other substances. To interpret the Act otherwise than I have done, would be to close an important market to the maple sugar producer, and would inflict an ungrateful hardship upon those who are fond of sweet meats. But it must, of course, be understood, that the maple sugar used for flavouring purposes, is genuine maple sugar; and this alone should be obtainable in Canadian markets.

The work herein recorded has been done entirely by Mr. A. Valin of this staff; and I can vouch for the intelligence and care with which the investigation has been conducted. Mr. Valin has an experience in connection with maple products dating from the publication of Bulletin No. 102 in 1905.

I beg to recommend publication of this report as Bulletin No. 415.

I have the honour to be, Sir,

Your obedient servant,

A. MCGILL,
Chief Analyst.

SPECIAL NOTE.

It must be distinctly understood that my opinion as stated in the foregoing report No. 415 must be regarded as personal. It is quite possible that the courts may interpret the meaning of Section 29A to forbid the employment of the word "maple" as an adjective. A final ruling could only be reached by means of a test case.

A. MCGILL,
Chief Analyst.